Twelve Years of Strawberry IPM in Maine: A Work in Progress

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Applied research is an important part of Maine’s Strawberry IPM Program. Past research has included evaluation of strawberry varieties for resistance to tarnished plant bug. Surveying impacts of strawberry bud weevil injury, and testing low risk pesticide efficacy and biological controls to reduce pest populations.

A Survey of Strawberry Inflorescence Injury Caused by the Strawberry Bud Weevil, Anthonomus signatus.
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Abstract:
Most clippers migrate into field from bordering wooded areas. Buds on the inflorescence were effected differently; and whether injury was influenced by plant location in a field. Three strawberry fields that received no insecticide applications in the spring were surveyed. Samples of 200 buds were examined in four different locations in each field. The number of inflorescences injured by strawberry bud weevil in a field varied from 10% to 64%. Most of the flower clusters showing injury had only one bud girdled, but many had two or more buds girdled. The tertiary and secondary order buds had the highest levels of injury, while the primary and quaternary buds had the lowest injury levels. Location of the plants in the field did not have any obvious effects on injury levels.

Vegetative and Floral Characteristics of Six Strawberry Cultivars Associated with Fruit Size, Yield and Susceptibility to Tarnished Plant Bug Injury.
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Abstract
Strawberry cultivars can differ in their susceptibility to tarnished plant bug injury, but the mechanisms for these differences have not been determined. Isolating such mechanisms would allow breeders to develop significant insect resistance in commercial strawberry cultivars. Selected vegetative and floral characteristics were measured in six strawberry cultivars grown in a perennial matted row system and compared to the yield data and levels of tarnished plant bug injury. "Mira" and "Meabe" had the highest marketable yield, followed by "Jewel" and "Sable". "Cabo" had the highest marketable yield. "Cabo" had the lowest fruit size, followed by "Jewel", "Mira", "Meabe", "Sable" and "Meabe". Naturally occurring levels of tarnished plant bug injury were lower than expected, but some significant differences were observed between the six cultivars. "Mira", "Meabe" and "Cabo" had the highest levels of tarnished plant bug injury. "Jewel", "Meabe" and "Sable" had lower levels of injury. There was no significant correlation between yield and levels of tarnished plant bug injury, reflecting the low levels of injury in this experiment. Of the floral parameters evaluated, only high pollen levels were significantly correlated with higher levels of tarnished plant bug injury. Flower size, flower number, pedicle length, peduncle length and number of stamens were not significantly correlated with injury. Primary flower diameter and flower dry weight was positively correlated with average fruit size. For the vegetative characteristics, neither pedicle length nor hairiness was significantly correlated to tarnished plant bug injury.

In 1992, the University of Maine Cooperative Extension initiated an integrated pest management program for strawberries. IPM scouts visited six volunteer farms and monitored strawberry fields for tarnished plant bug, strawberry bud weevil and two-spotted spider mites. Control recommendations for these pests were based upon economic thresholds developed in New York. In addition, growers were asked to follow a reduced spray program for control of grey mold, limiting applications to the bloom period. Initial results were very good. Growers reduced insecticide applications by more than 50% on some farms and even greater reductions in fungicide applications were observed. Losses from pests remained stable or were reduced on participating farms.

In 2005, Extension scouts monitored nine farms. Data from the farms was shared with other growers by a weekly newsletter (over 75 subscribers) and an internet IPM web page. In 1994 The Cooperative Extension systems of New England produced “Integrated Pest Management for Strawberries in the Northeastern United States”. This bulletin provides detailed instructions for growers who wish to use IPM techniques on their farms, including pest identification, monitoring, economic thresholds and control strategies. The New England Small Fruit Pest Management Guide is updated and revised every two years and emphasizes IPM methods.

In Annual evaluations of the program carried out through grower surveys have shown that the adoption of IPM practices in strawberries leads to significant reductions in pesticide use and can increase crop profitability. However, ability to implement IPM is hindered by time and management constraints common among small, diversified vegetable and fruit farms. While growers may be willing to pay for some private IPM services, there are very few available. Thus, Cooperative Extension must continue to take the lead in fostering IPM in Maine, and provide growers with the information necessary to make sound pest management decisions.